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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/24/2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 8, 9, and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwa et al. (US 6,624,952 as cited in the previous office action) in view of Tanide et al. (US 5,500,747.)

Kuwa teaches in figure 4 an apparatus for projection display, the apparatus comprising:

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An image generation device (PA) configured to generate an image formatted for display on a substantially planar surface (see figure 5 for example which shows a rear-projection TV using the lens system with a screen, it is well known that rear projection screens are generally planar surfaces and accordingly any image generated would be formatted for a substantially planar surface);

A wide angle lens system (GrR and GrF) having an optical axis configured to receive the image and project the image along an optical path for display above the apparatus; and

Direction changing optics (PR) configured to fold the optical path such that the optical path changes direction from a first direction to a second direction, the image generation device is positioned below the optical axis of the wide angle lens system (the optical axis is that of GrF since it faces a different direction and is off axis of that of PA; the image generation device is clearly positioned below the optical axis of the wide angle lens system).

Kuwa does not teach the projection display device being used in a front projection system and that it utilizes a wide angle lens that projects the image at a field angle of at least 100 degrees. With regards to the later, Kuwa specifically teaches in column 8, line 57 through column 90 line 23 that in general a field angle (angle of view) should be between 48 and 60 degrees as anything larger then 60 degrees would result in a substantial increase in cost and assembly time, however Tanide teaches that there are some circumstances involving front projection where such a field angle is worth the added

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costs and difficulty. Tanide teaches in column 2 lines 16-63 that in industrial projection uses, a projector with a wide angle lens allows a user to be free from a sense of oppression or unpleasant feelings in the presence of a projector body and that such a projector allows for projection on extremely large projection screens, including curved ones (which one of ordinary skill in the art would recognize are substantially planar at substantially large enough sizes), while allowing for some portability of the projection/screen components. Column 4 line 46 through column 5 line 7 of Tanide, teaches that by utilizing a wide angle lens having a field angle of 120 degrees or more, a viewer can obtain a feeling image reality at a short distance. Given all the advantages given by Tanide for using a wide-angle lens having a field angle of 100 degrees or more in industrial/entertainment applications, it would have been obvious to one of ordinary skill in the art when utilizing the projection system of Kuwa for an industrial/entertainment application to use the lens of Tanide.

With regards to front projection, it is well known in the art that the projectors of rear and front projection systems are interchangeable (see column 3 lines 62-67 of Tadic-Galeb et al. (US 6,473,236) for example, and also see *In re Japikse* 86 USPQ 70 (CCPA 1950), which teaches that a mere rearrangement of parts (in this case from behind the screen to in front of it) has been found to be obvious.) Accordingly since Tanide teaches the use of large screen where rear projection is not necessarily practical, it would have been obvious to make the projection system of Kuwa in view of Tanide a front projection system. (It should be noted that large planar screens are well known such as that in movie theaters,

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and that the wide-angle lens of Tanide would be able to project an image in such an environment.)

With regards to applicant's claim 2:

GrR is a relay lens stage while GrF is a wide-angle lens stage.

With regards to applicant's claim 3:

See column 6 lines 36-59 of Kuwa which teach that the pre-distortion system is the first stage (GrR), which includes the relay lenses.

With regards to applicant's claim 4:

Although the optical axis of Kuwa is bent between the wide angle lens system and the relay lens system, essentially the lens systems are the same optical axis in a the same way that applicant teaches in paragraph 28 of the current specification that lenses 315 and 345 are aligned in figure 3 of applicant's drawings.

With regards to applicant's claim 6:

As can be seen in figure 4 of Kuwa, if the first direction is considered to be toward the front of the projection device, the second which is at an angle greater then 90 is toward a rear of the projection display device (the vector of the light beam includes components that are the opposite of components of the vector of the first direction.)

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With regards to applicant's claim 8:

Clearly the two planes of Kuwa are not the same and at least part of the first plane is above the second plane.

With regards to applicant's claims 5, 9, 11, and 12:

See above, the second direction and first direction of Kuwa meet the claimed limitation of being substantially opposite (wherein substantially opposite is being held to be any angle between 270 and 90 degrees, at least part of the vector is substantially opposite.)

With regards to applicant's claim 13:

See column 1 lines 9-14 that teach the projection optical system of Kuwa is part of a projection device.

With regards to applicant's claim 14:

See above with regards to applicant's claim 6.

With regards to applicant's claim 15:

This is the purpose of the wide angle lens of Tanide; to be able to place the projector closer to a large view surface minimizing the throw distance while avoiding make a user uncomfortable or making the image distorted.

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4. Claims 7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwa in view of Tanide as applied to claims 1-6, 8, 9, and 11-15 above, and further in view of Cotton et al. (US 6,485,145 as cited in previous office actions.)

As described in more detail above Kuwa in view of Tanide teaches a projection display device that among other things includes a wide angle lens having two stages wherein the angle between the first and second stage forms an angle of 90 degrees or more, however Kuwa in view of Tanide does not teach the use of fold mirrors, especially two of them. Cotton teaches in figure 2 two fold mirrors (32) for redirecting the light substantially 180 degrees from the projection device. Cotton teaches in column 3 lines 50-63 that such a display system allows for an ultra thin panel compared to a lesser angle as taught in the figures of Kuwa. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two fold mirrors as taught by Cotton to redirect the light path at an angle of 180 degrees in the wide angle projection system of Kuwa in view of Tanide, as this allows for a smaller display.

5. Claims 21-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwa et al. in view of Booth et al. (US 5,642,927) and Tanide et al.

Kuwa teaches in figure 4 a projection system for displaying an image on a substantially planar display surface (see figure 5 for example which shows a rear-projection TV using the lens system with a screen, it is well known that rear projection screens are generally planar surfaces), the display surface forming a display plane, the projection system comprising:

A body (obvious but not specifically shown, also see figure 5 which shows the entire optical system mounted within a large housing);

A lens system disposed in the body (all of figure 4), wherein the lens system includes a relay lens stage (GrR), a wide angle lens stage (GrF), and direction changing optics (PR) interposed in the relay lens stage and the wide angle lens stage to form an optical path, where the direction changing optics change the optical path direction from a first direction towards a second direction.

Kuwa does not teach that the direction changing optics change the optical path direction from a first direction towards a front portion of the projector's body to a second direction towards the display surface which is disposed substantially adjacent the rear portion of the projection system. Such a system is taught by Booth, which teaches in figure 2 a projector that projects towards a display surface (72) disposed substantially adjacent a rear portion of the body of the projector. Booth teaches in column 2 lines 43-67 that this structure allows for a more compact projector. Since it is desirable to make a projector as small as possible, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Booth's direction changing design of the projector of Kuwa.

Kuwa in view of Booth does not teach the projection display device being used in a front projection system and that it utilizes a wide angle lens that projects the image at a field angle of at least 100 degrees. With regards to the later, Kuwa specifically teaches in

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column 8, line 57 through column 90 line 23 that in general a field angle (angle of view) should be between 48 and 60 degrees as anything larger than 60 degrees would result in a substantial increase in cost and assembly time, however Tanide teaches that there are some circumstances involving front projection where such a field angle is worth the added costs and difficulty. Tanide teaches in column 2 lines 16-63 that in industrial projection uses, a projector with a wide angle lens allows a user to be free from a sense of oppression or unpleasant feelings in the presence of a projector body and that such a projector allows for projection on extremely large projection screens including curved ones (which one of ordinary skill in the art would recognize are substantially planar at substantially large enough sizes), while allowing for some portability of the projection/screen components. Column 4 line 46 through column 5 line 7 of Tanide, teaches that by utilizing a wide angle lens having a field angle of 120 degrees or more, a viewer can obtain a feeling image reality at a short distance. Given all the advantages given by Tanide for using a wide-angle lens having a field angle of 100 degrees or more in industrial/entertainment applications, it would have been obvious to one of ordinary skill in the art when utilizing the projection system of Kuwa in view of Booth for an industrial/entertainment application to use the lens of Tanide.

With regards to front projection, it is well known in the art that the projectors of rear and front projection systems are interchangeable (see column 3 lines 62-67 of Tadic-Galeb et al. (US 6,473,236) for example, and also see *In re Japikse* 86 USPQ 70 (CCPA 1950), which teaches that a mere rearrangement of parts (in this case from behind the screen to

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in front of it) has been found to be obvious.) Accordingly since Tanide teaches the use of large screen where rear projection is not necessarily practical, it would have been obvious to make the projection system of Kuwa in view of Booth and Tanide a front projection system. It is also well known use planar display surfaces where a curved surface is not necessary or practical for example most movie theaters have substantially planar display surfaces.

With regards to applicant's claim 22:

The stage that proves the filed angle greater than 100 degrees is the wide-angle lens stage.

With regards to applicant's claim 23:

It is clear that when Kuwa is used in a system such as Booth the relay lens stage would be disposed on a plane below the wide angle lens stage (Kuwa's direction changing optics would be equivalent to part 70 of Booth.)

With regards to applicant's claim 24 and 25:

As is shown in Booth the DMD is offset from the projection system, further the exact disposition of the lens is adjustable which would allow for the offset to be either in an up position or down position depending on the shape and form of the aberration being corrected for by the operator of the projector.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-14 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 16 and 15 of copending Application No. 10754093 in view of Cotton et al. (US 6,485,145).

Claims 3, 16, and 17 of the '093 claim an apparatus for a projection display with an obvious image generation device (in order to have an image something must generate it) a wide angle lens system, a relay lens system, and a direction changing optics, however those direction changing optics are not claimed in '093 application. As taught by Cotton in figure 2 a reflection based wide-angle projection system (32) can be made to be redirected by an angle of 180 degrees, with two fold mirrors (a redirection device).

Cotton teaches in column 3 lines 50-63 that such a display system allows for an ultra thin panel. Accordingly it would have been obvious to one of ordinary skill in the art to use the fold mirrors of Cotton as a redirection device in the '093 application.

This is a provisional obviousness-type double patenting rejection.

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8. Claims 21-25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 16 and 15 of copending Application No. 10754093 in view of Booth et al. (US 5,642,927.)

Claims 3, 16, and 17 of the '093 claim an apparatus for a projection display with an obvious image generation device (in order to have an image something must generate it) a wide angle lens system, a relay lens system, and a direction changing optics, however those direction changing optics are not specifically claimed in '093 application.

The '093 application does not claim that the direction changing optics change the optical path direction from a first direction towards a front portion of the projector's body to a second direction towards the display surface which is disposed substantially adjacent the rear portion of the projection system. Such a system is taught by Booth, which teaches in figure 2 a projector that projects towards a display surface (72) disposed substantially adjacent a rear portion of the body of the projector. Booth teaches in column 2 lines 43-67 that this structure allows for a more compact projector. Since it is desirable to make a projector as small as possible, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Booth's direction changing design of the projector claimed in the claims of the '093 application.

Response to Arguments

9. Applicant's arguments filed 4/24/2006 have been fully considered but they are not persuasive.

Applicant argues that the addition of the limitations of an image generation device configured to generate an image formatted for display on a substantially planar surface as is claimed in applicant's claim 1 or a wide angle lens for projecting onto a substantially planar surface as claimed in claim 9 or a front projection system including a substantially planar display surface as is claimed in applicant's claim 21; overcomes the 35 U.S.C. § 103 rejection based on in at least Kuwa in view of Tanide et al. (see above for the content of the rejections. Each independent claim will be addressed separately. With regards to claim 1; while it is true that Tanide is directed specifically towards a curved screen application, its lens would be functional in a non-curved environment and applicant's claim limitation is not for a wide angle lens system which projects a undistorted image on a planar surface, but rather an image generation device that generates an image formatted for display on a substantially planar surface, without regards to the particular lens it is projecting it through or the quality of the image that would be displayed on said planar surface. With regards to applicant's claim 9; all that is required is that the lens be able to project an image onto a substantially planar surface, which any wide-angle lens would be able to. With regards to applicant's claim 21; applicant only claims a front projection system that includes a planar display surface, the claim does not claim that the lens system projects on said planar display surface. The

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dependent claims are rejected for the reasons given in the above rejections and for the reasons just outlined above given that they are dependent on the above independent claims.

Applicant is directed towards MPEP 2114, specifically with regards to the Wide angle lens system and the substantially planar surface. Applicant should also note that a substantially planar surface does not exclude a surface with some curvature and that any curved surface can be considered substantially planar if it is sufficiently large (this is what calculus is based upon.)

Accordingly applicant's arguments were not found persuasive and the rejection has been made.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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AS



Andrew Sever